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General Properties of Steels

The following table lists the typical properties of steels at room temperature. The wide ranges of ultimate tensile strength, yield strength, and hardness are due to different heat treatment conditions.

Properties	Carbon Steels	Alloy Steels	Stainless Steels	Ti Steels
Density (1000 kg/m ³)	7.85	7.85	7.75-8.1	7.7
Elastic Modulus (GPa)	190-210	190-210	190-210	190
Poisson's Ratio	0.27-0.3	0.27-0.3	0.27-0.3	0.2
Thermal Expansion (10 ⁻⁶ /K)	11-16.6	9.0-15	9.0-20.7	9.4
Melting Point (°C)			1371-1454	
Thermal Conductivity (W/m-K)	24.3-65.2	26-48.6	11.2-36.7	19.9
Specific Heat (J/kg-K)	450-2081	452-1499	420-500	
Electrical Resistivity (10 ⁻⁹ Ω-m)	130-1250	210-1251	75.7-1020	
Tensile Strength (MPa)	276-1882	758-1882	515-827	640
Yield Strength (MPa)	186-758	366-1793	207-552	380
Percent Elongation (%)	10-32	4-31	12-40	5
Hardness (Brinell 3000kg)	86-388	149-627	137-595	210



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